Before the
Federal Communications Commission
Washington, D.C. 20554

In the matter of	)	
	)	
Terion, Inc.	)	**File No. D145266**
	)	
Application to modify the conditions of its authorization for its nationwide high frequency locating, monitoring and telemetering system, to increase overall system capacity, and to allow application for renewal prior to adoption of final rules governing this type of operation	)))))))	**Call Sign: WPKU683**

ORDER

Adopted: March 6, 2002 **Released: March 7, 2002**

By the Chief, Wireless Telecommunications Bureau:

I. INTRODUCTION

1. The Wireless Telecommunications Bureau ("WTB") hereby grants in part the captioned application, as amended, of Terion, Inc.[1] ("Terion") for modification of four of the conditions of its existing authorization (WPKU683) to install and operate low-power mobile and fixed units that transmit in the high frequency (HF) bands.[2] The HF transmissions from these remote units constitute the response path in Terion's "Digital High Frequency" ("DHF") system, which is a nationwide two-way locating, monitoring and telemetering system.[3] For reasons set forth herein, we are replacing the existing conditions, equipment specifications, and carrier frequency list currently applicable to Terion's authorization with the modified, consolidated and updated conditions attached hereto. The modified conditions, among other things, no longer provide that the authorization for the DHF system may be renewed only in accordance with final rules governing this type of operation. We are, however, denying Terion's request for

[1] Terion, Inc. describes itself in its press releases as a "business-to-business wireless application service provider using two-way wireless communications." Terion press releases are posted on the internet at http://www.terion.com/press_releases/index.asp

[2] The high frequency (HF) range of the electromagnetic spectrum is that portion from 3 MHz to 30 MHz.

[3] Terion in the instant application described this system as "a specialized wide-area messaging and tracking service using an innovative digital transmission system adapted from technology developed by Harris Corporation for military purposes." Application, Exhibit 1.

modifications to increase the traffic capacity of this system.[4] In response to changed economic circumstances, Terion has recently decided not to expand use of the DHF system, but instead to phase out the existing DHF service.[5] Consequently, authorizing an increase in system capacity appears to be unnecessary at this time. We are, however, updating the carrier frequency list, consolidating the operating and technical conditions, and removing the restriction on renewal of the authorization. We conclude that our actions herein serve the public interest by providing for continued operation of the DHF system with its originally-authorized capacity, to serve remaining customers during the phase out of service.

II. BACKGROUND

2. On July 10, 1997, WTB and the Office of Engineering and Technology ("OET") granted Terion[6] a five-year authorization to construct and operate a nationwide commercial two-way short-data messaging system in the HF range of the electromagnetic spectrum.[7] The authorization specifies 954 channels[8] and is subject to special conditions and equipment requirements that are designed to allow Terion's system to utilize the HF range of the electromagnetic spectrum without impairing the operations of other HF users.[9] Included within these special conditions are certain technical requirements that, together with the number of channels, effectively limit the message capacity of Terion's system.[10]

3. On August 11, 1997, WTB modified its earlier grant by adding another condition, which provides that Terion's authorization may be renewed only in accordance with "final rules regularly permitting operations of this type in the HF portion of the electromagnetic spectrum."[11] In doing so, the Commission stated that it would initiate a rule making proceeding to consider such rules after technical data obtained from operation of the Terion system becomes available.[12]

4. After 18 months of testing, Terion launched full commercial service on October 1, 1999. According to Terion, the demand for its HF-based service increased rapidly.

[4] Terion requested modifications that would allow it to use additional channels, transmit more radio frequency energy per day, and employ a longer occupancy (transmission time per hour per geographic area).

[5] See Terion press release "Terion to Focus On FleetView Trailer Tracking Product", August 17,2001, on the internet at http://www.terion.com/press_releases/fleetview_focus_cranston_named_president.asp

[6] Terion was then known as Flash Comm, Inc.

[7] DA 97-1451, 12 FCC Rcd 9877 (1977). In granting the authorization, OET and WTB waived several rules that govern permissible use of the HF range of the electromagnetic spectrum, Sections 2.102(h)(1) and (h)(2), 90.266(b), (f) and (g), and two rules that specify operating procedures for private radio service stations, Sections 90.75(d) and 90.425(a).

[8] The Terion system uses HF channels with a bandwidth of 3 kHz each, which are listed in the conditions attached hereto by their carrier (center) frequencies.

[9] The HF portion of the spectrum is home to a variety of important government and non-government uses, including military and national defense, disaster relief, short-wave broadcasting, maritime safety, and amateur radio.

[10] Although the authorization does not specifically limit the number of units it may deploy, Terion calculates that the existing conditions limit the theoretical capacity of its system to no more than 32,258 truck mounted units. Based on historical sales growth, Terion projected that it would reach this limit in 2001.

[11] DA 97-1710, 12 FCC Rcd 12029 (1997).

[12] *Id.*

On July 28, 2000, Terion filed an FCC Form 600 application (File No. D145266) requesting that the conditions of its authorization be modified to specify additional channels,[13] allow additional capacity for its system, and provide for possible renewal of the authorization notwithstanding the status of any rule making proceeding looking to establish rules providing for regular operation of this type of system.

5. WTB issued a Public Notice on November 17, 2000 seeking comment on Terion's modification application.[14] One comment was filed, by the National Association for Amateur Radio *a.k.a.* American Radio Relay League, Inc. ("ARRL"). ARRL believes that Terion's system is incompatible with amateur radio operations. While acknowledging that the instant Terion application does not involve current amateur radio service allocations, ARRL is concerned that some of the frequencies requested by Terion fall within frequency bands that may be allocated to the Amateur Radio Service in the future,[15] *e.g.* pursuant to actions in matters on the agenda for WRC-2003.[16] Terion replies that it has never sought to use Amateur Radio Service frequency bands and that its system can readily discontinue use of frequencies or frequency bands if allocations change.[17]

6. OET referred Terion's request to the Interdepartmental Radio Advisory Council ("IRAC"), an inter-governmental organization that coordinates the licensing of shared government / non-government frequency allocations. As a result of this coordination process, the National Telecommunications and Information Administration ("NTIA") and the Federal Emergency Management Agency ("FEMA") requested that the Commission not include certain individual carrier frequencies and frequency bands in Terion's authorized carrier frequency list, in order to avoid potential interference to short-wave broadcasting and to existing federal uses.[18] NTIA and FEMA also provided these carrier frequency exclusion requests to Terion.

7. On June 5, 2001 and August 10, 2001, Terion filed amendments to its application, deleting numerous specific carrier frequencies that it had originally requested, including all of the carrier frequencies and frequency bands identified by NTIA and FEMA, and also those that are allocated to and used by two Part 95 services.[19]

8. On September 13, 2001, Terion's legal counsel informed the Commission by letter that Terion had recently notified its customers that, in light of changed economic circumstances, it would suspend use of its "partially RF-based Mobile Cab Communications operations" (*i.e.* the

[13] Terion initially requested that the number of channels be quadrupled, to 3816.

[14] Public Notice, "Wireless Telecommunications Bureau seeks comment on Terion, Inc.'s request to modify its authorization to operate a short-data messaging system in the high frequency (HF) range under Part 90 of the rules", DA 00-2600 (November 17, 2000).

[15] Terion requested to use frequencies that fall within the 5250-5400 kHz frequency range. Since the end of the pleading cycle in this matter, the ARRL filed a Petition for Rule Making (RM-10209) requesting that frequency band be allocated for domestic amateur radio use.

[16] Comments of ARRL, The National Association for Amateur Radio, at 4.

[17] Reply Comments of Terion, Inc., at 3.

[18] The NTIA request comprised the combined requests of the Justice Department, U.S. Coast Guard, and the Broadcasting Board of Governors.

[19] Specifically, the Citizens Band Radio Service and the Radio Control (R/C) Radio Service.

DHF system).[20] Despite this, Terion reiterated its request that the Commission process its modification application. Subsequently, WTB staff informed Terion's counsel by telephone that, in view of the planned phase-out of the DHF system, a revised justification would be needed for WTB to grant Terion's traffic capacity expansion request. In a later telephone conversation, Terion's counsel indicated that Terion does not plan to add anything further to this record.

III. DISCUSSION

9. In light of Terion's announced plans to suspend or phase out operations of its DHF system, we find that expansion of the authorized carrier frequency list and concomitant relaxation of the existing limits on system traffic capacity is, at this time, unwarranted. Accordingly, we deny this request.

10. The recently completed federal frequency coordination effort associated with processing this application identified a number of carrier frequencies on the original authorized carrier frequency list that we now conclude should be deleted in order to protect federal and international broadcasting operations.[21] Therefore, we are modifying Terion's authorized carrier frequency list to delete these frequencies and to add an equivalent number of carrier frequencies (from the additional carrier frequencies requested by Terion) that were cleared by the recent coordination process. The net result of these modifications is that the total number of Terion's authorized carrier frequencies remains unchanged. [22]

11. We are removing the condition on Terion's authorization that provides that it may be renewed only in accordance with final rules regularly permitting operations of this type. When we established this condition, we noted that operation of Terion's system could provide valuable technical data that would assist the Commission in evaluating proposals to establish rules permitting permanent operations of this type in the HF spectrum.[23] We also indicated that the Commission would initiate a rule making proceeding for that purpose after Terion commenced operations and the aforementioned technical data became available. The Commission, however, has not initiated such a rule making proceeding, and in view of the uncertain future of Terion's HF system, there appears to be little justification for doing so at this time. In the event Terion seeks renewal when its initial authorization expires in July 2002, its authorization may be renewed upon proper application.[24]

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[20] Letter from Robert L. Petit, Wiley, Rein & Fielding LLP, Counsel for Terion, Inc. to Magalie Salas, Secretary, Federal Communications Commission, dated September 13, 2001.

[21] Terion may have already "locked out" (refrained from using) these carrier frequencies.

[22] No carrier frequencies falling within current Amateur Radio Service allocations, the 5250-5400 kHz band, or the 6900-7000 kHz band are included in this authorization. Furthermore, condition 11 attached hereto specifically protects current and future Amateur Radio Service frequency allocations. Consequently, the concern expressed by ARRL is moot.

[23] See note 11.

[24] In addition, we are making minor amendments to the authorization conditions to reflect the change in company name from Flash Comm, Inc. to Terion, Inc, to use current FCC equipment authorization program terminology, and to delete the requirement concerning the number of receive sites during the first year of operation (which has passed). We are also combining the equipment technical requirements and the authorized frequency list into the conditions, resulting in a single license attachment instead of three.

IV. ORDERING CLAUSE

12. In view of the foregoing, IT IS ORDERED That the Application of Terion, Inc. for modification of its Part 90 authorization in the Industrial/Business Radio Service is granted-in-part as set forth herein, subject to the terms and conditions attached hereto, and denied in all other respects. This action is taken under authority delegated in Section 0.331 of the Commissions Rules, 47 C.F.R. 0.331.

FEDERAL COMMUNICATIONS COMMISSION

Thomas J. Sugrue

Chief, Wireless Telecommunications Bureau

Terion Authorized Carrier Frequencies (kHz)

Call Sign WPKU683
File No. D145266

Pursuant to Order of the Wireless Telecommunications Bureau, DA 02-545, adopted on March 6, 2002 and released on March 7, 2002, the authority of Terion, Inc. ("the licensee") to operate its commercial short-data messaging, locating, telemetry and monitoring system ("the system") using the high frequency ("HF") portion of the electromagnetic spectrum (3 to 24 MHz) is subject to the following conditions:

1. Secondary service. The service provided by the system is a secondary service subject to the provisions of Section 2.104(d)(3) of the Federal Communications Commission (FCC) rules (47 C.F.R. § 2.104(d)(3)).

2. Equipment certification. Each HF transmitter used by the system must be of a type that has received a grant of certification pursuant to the Equipment Authorization Procedures set forth in Part 2, Subpart J of the FCC rules (47 C.F.R. part 2, subpart J). Grant of certification will be based on compliance with the following equipment technical specifications:

a. Transmitter power output. The transmitter power output must not exceed 15 Watts.

b. Carrier frequency stability. The carrier frequency must be stable to ± 10 parts per million over an environmental temperature range of –20 to +70 degrees Celsius.

c. Emission type. The operational modulated emission type must be 2K80G1D. Type N0N emission capability is permitted in a test mode; otherwise the energy must be spread over a 2.8 kHz bandwidth.

d. Emission mask. The authorized bandwidth is 3.0 kHz. The power of emissions outside of the authorized bandwidth must be attenuated below the power of the unmodulated carrier wave in accordance with the following:

On any frequency displaced from the carrier frequency by:	the power of emissions must be attenuated by:
1.5 to 4.0 kHz	At least 25 dB
4.0 to 7.5 kHz	At least 35 dB
More than 7.5 kHz	At least 43 dB

3. Station identification. Each HF transmitted packet must be identified by a digital identifier embedded in the preamble of the packet.

4. Duration of transmissions. The duration of each HF transmission by each transmitter must not exceed 4 seconds. The licensee must maintain a daily record of the 7-day moving average of the durations of all completed HF transmissions and notify the FCC by letter if it appears that such average is regularly exceeding 2 seconds.

5. Occupancy. Accumulated transmissions by the system on each HF channel must not exceed one percent (36 seconds) in each hour in each geographical area in the contiguous United States bounded by each 5 degrees of latitude (beginning at 49° North Latitude and proceeding Southward) and each 5 degrees of longitude (beginning at 70° West Longitude and proceeding Westward).

6. Daily average power density limit; daily transmitted energy limit. The number of messages transmitted by the system must be limited such that (a) the daily accumulated average power density over the contiguous United States does not exceed –174 dBW/Hz-m² and (b) the total HF radio frequency energy transmitted daily by the system does not exceed 2 million Watt-seconds.

7. Radiated power. The radiated power of the HF transmitter and its antenna system(s) as typically installed must not exceed one Watt. Radiated power is considered to be the antenna current squared multiplied by the theoretical radiation resistance of the antenna at the operating frequency, that is, it excludes ohmic and ground losses.

8. Master control center functions. HF transmissions must be controlled by a master control center that is capable of (a) preventing transmissions on individual channels or frequency bands and (b) shutting down the entire system. The master control center must assess HF channel occupancy using a minimum of six diverse receive sites. HF channel occupancy assessments indicating a clear (available) channel must be valid for no longer than 10 seconds. HF transmitters must not transmit on any channel unless and until that channel has been declared clear by the master control center. If the master control center is directed by an authorized official of the FCC to cease transmissions on specific HF channel(s), transmissions on the specified channel(s) must cease within one hour after such direction. If an authorized official of the National Telecommunications and Information Administration (NTIA) advises the FCC that the system should cease all transmissions on specific HF channel(s), the FCC may immediately direct the master control center to do so.

9. HF transmitting antennas. HF transmit antennas used in the system must be of a type that has no more directivity than a half-wavelength dipole antenna or a quarter-wavelength monopole on a ground plane, based on free-space radiation patterns.

10. Publicly available log of transmissions. The licensee must log and make publicly available via the internet the time, frequency, location and duration of all completed HF transmissions for the prior 24 hours. The uniform resource locator (URL) or web site address of the internet log must be provided to the FCC and to the NTIA. To the extent possible, the log data must be sorted and presented in a manner that facilitates identification of specific transmissions.

11. Carrier frequencies. The system may make HF transmissions using only the carrier frequencies specified on the following pages (in kHz). This list of carrier frequencies may be modified at the licensee's request, in consultation with the FCC and the NTIA, provided that (a) the total number of 3 kHz (bandwidth) channels listed for use by the system does not exceed 914 (equivalent to a total authorized spectrum of 2.742 MHz) and (b) a 15 kHz guard band is maintained between spectrum used by the system and all aeronautical, radio astronomy, maritime, amateur, time standard and industrial, scientific and medical bands. The FCC may modify the list of carrier frequencies if necessary to accommodate changes in international or domestic HF band allocations to the aforementioned primary services.

Terion Authorized Carrier Frequencies (kHz)

3171	5121	5775	6837	7602	7758	9144			11430
3174	5124	5778	6840	7605	7761	9147	9315	10275	11433
3177	5127	5781	6843	7608	7764	9150	9318		
3180		5784	6846	7611	7767	9153	9321	10281	11439
3183	5133	5787	6849		7770	9156	9324	10284	11442
3186	5136	5790	6852	7635		9159	9327	10287	11445
3189	5139	5793	6855	7638	7917	9162		10290	11448
3192	5142	5796	6858	7641	7920		9339	10293	11451
3195	5145	5799	6861	7644	7923	9174	9342		11454
3198	5148	5802		7647	7926		9345	10302	11457
3201	5151	5805	6867	7650	7929	9180		10305	11460
	5154	5808	6870	7653	7932		10164	10308	11463
4452	5157	5811	6873		7935	9192	10167	10311	11466
4455	5160	5814	6876	7662	7938			10314	11469
4458	5163	5817	6879	7665	7941	9201	10173	10317	11472
4461	5166		6882	7668	7944	9204	10176	10320	11475
4464		5826		7671	7947	9207	10179	10323	11478
4467	5172	5829	7500	7674	7950	9210	10182		11481
4470	5175	5832	7503	7677	7953	9213	10185	10329	11484
4473	5178	5835	7506	7680	7956	9216	10188		11487
4476	5181	5838	7509	7683	7959	9219	10191	10344	11490
4479	5184		7512	7686	7962	9222		10347	
4482	5187	5844	7515	7689	7965	9225	10197	10350	11496
4485	5190		7518	7692	7968	9228	10200		11499
4488	5193	5850	7521	7695	7971	9231	10203	10359	11502
4491	5196	5853	7524	7698	7974	9234	10206	10362	11505
	5199		7527	7701	7977	9237	10209	10365	11508
4926	5202	5859	7530	7704	7980		10212		11511
4929	5205	5862		7707	7983	9243	10215	10383	
4932	5208	5865	7548	7710	7986	9246	10218	10386	11517
4935			7551	7713	7989	9249	10221		11520
4938	5214	6780	7554	7716	7992	9252		10395	11523
4941		6783	7557	7719	7995	9255	10230	10398	11526
4944	5232	6786	7560	7722	7998	9258	10233	10401	11529
4947		6789	7563	7725	8001	9261	10236	10404	11532
4950	5745	6792	7566	7728		9264	10239	10407	11535
4953	5748	6795	7569	7731	9105	9267	10242	10410	11538
4956	5751	6798	7572	7734		9270	10245	10413	11541
4959	5754			7737	9114	9273	10248	10416	11544
4962	5757	6819	7584	7740	9117	9276	10251		11547
4965	5760		7587	7743			10254	11415	11550
4968	5763	6825	7590	7746	9132	9285	10257	11418	11553
4971	5766	6828	7593	7749	9135		10260	11421	11556
4974	5769	6831	7596	7752	9138	9306	10263	11424	11559
4977	5772	6834	7599	7755	9141	9309	10266	11427	11562

Terion Authorized Carrier Frequencies (kHz)

11565	13509	14454	15888	16023	17451	18318	19236	19371	19506
11568	13512	14457	15891		17454	18321	19239	19374	19509
11571	13515		15894	16032	17457	18324	19242	19377	19512
11574	13518	14466	15897	16035		18327	19245	19380	19515
11577	13521	14469	15900	16038	18045	18330	19248	19383	19518
	13524	14472	15903	16041	18048		19251	19386	19521
12171	13527	14475	15906	16044	18051	19116	19254	19389	19524
12174	13530	14478	15909	16047	18054	19119	19257	19392	19527
12177	13533	14481	15912	16050		19122	19260	19395	19530
12180		14484	15915	16053	18183	19125	19263	19398	19533
12183	13542	14487	15918	16056	18186	19128	19266	19401	19536
12186	13545	14490	15921	16059		19131	19269	19404	19539
12189	13548	14493	15924	16062	18192	19134	19272	19407	19542
12192	13551		15927	16065		19137	19275	19410	19545
12195	13554	14502	15930	16068	18201	19140	19278	19413	19548
12198			15933	16071	18204	19143	19281	19416	19551
12201	14364	14511	15936	16074	18207	19146	19284	19419	19554
12204	14367	14514	15939	16077	18210	19149	19287	19422	19557
12207	14370		15942	16080	18213	19152	19290	19425	19560
12210	14373	14523	15945	16083	18216	19155	19293	19428	19563
12213	14376		15948	16086	18219	19158	19296	19431	19566
	14379	15816	15951	16089		19161	19299	19434	19569
13425	14382	15819		16092	18237	19164	19302	19437	19572
13428	14385	15822	15957	16095	18240	19167	19305	19440	19575
13431	14388	15825	15960	16098	18243	19170	19308	19443	19578
13434	14391	15828	15963	16101	18246	19173	19311	19446	19581
13437	14394	15831	15966	16104	18249	19176	19314	19449	19584
13440	14397	15834	15969	16107		19179	19317	19452	19587
13443	14400	15837	15972	16110	18261	19182	19320	19455	19590
	14403		15975	16113	18264	19185	19323	19458	19593
13449	14406	15843	15978	16116	18267	19188	19326	19461	19596
13452	14409	15846		16119	18270	19191	19329	19464	19599
13455	14412	15849	15984	16122	18273	19194	19332	19467	19602
13458	14415	15852	15987	16125	18276	19197	19335	19470	19605
13461	14418	15855	15990	16128		19200	19338	19473	19608
13464	14421	15858	15993	16131	18288	19203	19341	19476	19611
13467	14424	15861	15996		18291	19206	19344	19479	19614
13470	14427	15864	15999	17427	18294	19209		19482	19617
13473	14430	15867	16002	17430	18297	19212	19350	19485	19620
13476	14433	15870	16005	17433	18300	19215	19353	19488	19623
13479	14436	15873	16008	17436	18303	19218	19356	19491	19626
	14439	15876	16011	17439	18306		19359	19494	19629
13500	14442	15879	16014	17442	18309	19227	19362	19497	19632
13503	14445	15882	16017	17445	18312	19230	19365	19500	19635
13506		15885	16020	17448	18315	19233	19368	19503	19638

Terion Authorized Carrier Frequencies (kHz)

19641	20085	23385
19644	20088	
19647		23394
19650	20100	23397
19653	20103	23400
19656	20106	
19659	20109	23406
19662	20112	23409
19665	20115	23412
	20118	23415
19815	20121	23418
19818	20124	23421
19821		23424
19824	21870	23427
19827	21873	23430
19830	21876	23433
19833	21879	23436
19836	21882	23439
19839	21885	23442
19842	21888	23445
19845	21891	23448
19848	21894	
19851	21897	23454
19854	21900	
19857	21903	23460
19860	21906	23463
19863		23466
	22869	23469
20031	22872	23472
20034	22875	23475
20037	22878	23478
20040	22881	23481
20043	22884	23484
20046	22887	23487
20049	22890	23490
20052	22893	23493
20055	22896	23496
20058	22899	23499
	22902	23502
20067	22905	23505
20070		23508
20073	23364	
20076	23367	
20079		
20082	23382	